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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/181,809 10/29/98 ISHII

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EXAMINER

WM01/1023

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P O BOX 19928
ALEXANDRIA VA 22320

ART UNIT

PAPER NUMBER

2651

DATE MAILED:

10/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/181,809

Applicant(s)

ISHII ET AL.

Examiner

Kim-Kwok CHU

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed on 6/28/01 and 8/3/01.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Argument

1. Applicant's Remarks filed on August 03, 2001 have been fully considered but they are not persuasive.

(a) Amendment filed on 8/3/01 adds an additional subject matter "a substrate which sustains the optical recording layer" to independent claims 1, 21, 35, 37 39 and 55. The added "substrate" does not overcome the 35 USC § 112 first paragraph because the claims are still single means claims. First, the added "substrate" is an inherent feature of the claims optical recording medium. Second, the added "substrate" has nothing to do with Applicant's invention. In other words, even including the additional element of "substrate", Applicant's invention still containing only a "recording layer including an optical recording material" which covered every conceivable means for achieving the stated purpose (rotates the light angle and functions as a half-wave plate) was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.

(b) Applicant states that the prior art does not externally control the light beam. Accordingly, before the Amendment filed on June 28, 2001, Applicant does not claim this feature.

(c) Based on the amended claims, a new prior art is used as a reference for rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-10, 21, 35-39 and 55 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

(a) claim 1 is a single means claim containing only a "recording layer including an optical recording material" which covered every conceivable means for achieving the stated purpose (rotates the light angle and functions as a half-wave plate) was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor; and

(b) similarly, in claims 21, 35, 37, 39 and 55 is a single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only

those means known to the inventor.

4. Claims 2-10, 36 and 38 not mentioned above are rejected base on its dependence on a rejected claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

6. Claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34 and 43-55 are rejected under 35 U.S.C. § 102(b) as being anticipated by Leube et al. (U.S. Patent 5,251,197)

Leube teaches an optical recording medium having all of the steps recited in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34 and 43-55. For example, Leube teaches the following:

(a) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, a light source 14 for radiating a recording/reproducing light along a diameter direction of an optical recording medium 12 (Fig. 1);

(b) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34,

and 43-55, a light focusing system (focusing means such as an objective lens is an inherent feature);

(c) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, a reproducing light system 16 that irradiates the optical recording medium 12 with reproducing light (Fig. 1);

(d) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, at least one optical layer 12 (Fig. 1; column 2, line 22-25);

(e) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, the optical layer 12 including an optical material having at least one of a polymer or a liquid crystal polymer that changes a state of photo-induced birefringence in response to recording light (Fig. 1; column 1, lines 57-60);

(f) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, the recording light that is externally controlled from the optical recording medium to rotate a polarization angle of the recording light (Fig. 1; column 8, lines 27-59);

(g) as in claims 1-5, 10-15, 20-22, 24-26, 28-31, 33, 34, and 43-55, a portion of the recording layer 12 that changes a state of photo-induced birefringence acting optically as a half-wave/quarter plate (Fig. 1; inherent feature of the optical material because it is made of liquid crystal);

(h) as in claims 2 and 12, the recording layer 2 has a refractive index expresses in variables of wavelength and

thickness as $-n * d = (m + 1/2) * \Sigma$ (inherent feature where the a light refraction angle depends on an irradiating light's wavelength);

(i) as in claims 3 and 13, the photo-induced birefringence is caused by a refractive index change (inherent feature of the birefringence);

(j) as in claims 4, 5, 14 and 15, the recording layer 12 comprises a liquid crystal polymer (azobenzene) which is photoisomerized (Fig. 1; column 2, line 51);

(k) as in claims 10, 20, 24, 28, 34, 48 and 51, the optical layer 2 has a disk shape recording medium (Fig. 1);

(l) as in claim 11, an optical reflection layer (Fig. 1; a reflection layer in an optical disk is an inherent feature);

(m) as in claim 21, the optical recording layer that includes a material in which an azimuth of birefringence that is included by recording light changes in response to a rotation of a polarization angle of the recording layer (Fig. 1);

(n) as in claims 22 and 26, step of using the recording layer 12 to control a polarization angle of recording light (Fig. 1; the recording material is liquid crystal which can be used to control the polarization angle of the recording light);

(o) as in claims 22 and 26, step of using the liquid crystal polymer as a half wave plate (inherent feature of the

liquid crystal material);

(p) as in claims 25 and 29, the optical element (azobenzene) is formed in a position at least partially coextensive an existing optical element in the optical recording medium 12 (Fig. 1);

(q) as in claims 30 and 31, a spatial optical modulator 7 that controls a polarization angle of the recording light (Fig. 4);

(r) as in claims 33, 45, 47 and 50, the optical recording apparatus having a medium driving and head moving mechanism (disc driving and head moving mechanism is an inherent feature);

(s) as in claim 44, the reproducing light has a light intensity smaller than that of the recording light (inherent feature where data reading light intensity is always smaller than data writing intensity);

(t) as in claims 46, 49, 52, 53 and 54, an analyzing unit 20 that detects a polarization angle of recording light (Fig. 1; detector 20 detects the recording light and its polarization); and

(u) as in claim 55, the optical element formed on the recording layer adjust a polarization angle of a reproducing light by an amount greater than a difference between a polarization angle of recording light (inherent feature where

the optical element is a wave plate).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 6-9, 16-19, 23, 27, 32 and 35-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leube et al. (5,251,197) in view of Tsujioka et al. (U.S. Patent 5,316,900) and further in view of Chen et al. (U.S. Patent 5,488,597)

Leube teaches an optical recording medium having a recording layer made of liquid crystal polymer (azobenzene) very similar to that of the instant invention. In addition to above features, Leube teaches the following:

(a) as in claims 8 and 18, the recording layer 12 comprises a liquid crystal polymer (azobenzene) which is photoisomerized (Fig. 1; column 2, line 51);

(b) as in claims 36 and 38, the optical layer 2 has a disk shape recording medium (Fig. 1);

(c) as in claim 41, the reproducing light has a light

intensity smaller than that of the recording light (inherent feature where data reading light intensity is always smaller than data writing intensity).

(d) as in claim 42, the optical recording apparatus having a medium driving and head moving mechanism (disc driving and head moving mechanism is an inherent feature);

However, Leube does not teach the following:

(a) as in claims 6, 9, 16 and 19, the polymer comprises at least one kind of monomer-polymer azobenzene;

(b) as in claim 7, 8 and 17, the recording layer comprises a polymer in which photoisomerized molecules are dispersed;

(c) as in claims 23, 27 and 32, directing the recording light to a polarization rotary device 7;

(d) as in claims 35, 37, 39 and 40, the recording medium stores multilevel information.

Tsuijoka teaches an optical recording medium having a polymer layer as in above items (a) and (b). In addition, Tsuijoka teaches an optical recording medium having a light polarization device 7 as in above items (c) (Fig. 4).

Chen teaches a multilayer optical memory having recording media layers sensitive to the polarization of a light beam (Fig. 6).

The use polymer such as azobenzene and photoisomerized

molecules are not novel. It is just an optional choice of conventional liquid crystal materials. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use above materials as a liquid crystal recording layers, because such materials can act as a half-wave or quarter-wave plate in order to rotate the polarization of a light beam irradiate on it.

On the other hand, a multilevel information optical recording medium is formed by at least two layers of the same recording medium. It is becoming common that an optical storage disc contains several recording layers in order to increase its storage capacity. When there is a motivation of raising the storage limit of an optical recording medium, it would have been obvious to one of ordinary skill in the art at the time of invention to use a multilayer recording medium such as Chen's instead of a single layer recording medium of Leube's, because a multilayer recording medium has the advantage of storing multiple times of information than a single layer recording medium.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks Washington, D.C.
20231 Or faxed to:

(703) 872-9314 (for formal communications intended for
entry. Or:

(703) 746-6909, (for informal or draft communications,
please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park
II, 2021 Crystal Drive, Arlington. VA., Sixth Floor
(Receptionist).

Any inquiry of a general nature or relating to the status
of this application should be directed to the Group
receptionist whose telephone number is (703) 305-4700.

Any inquiry concerning this communication or earlier
communications from the examiner should be directed to Kim CHU
whose telephone number is (703) 305-3032 between 9:30 am to
6:00 pm, Monday to Friday.

lc 10/18/01

Kim-Kwok CHU
Examiner AU2651
October 18, 2001

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